

SEC.760

Abstract of the Disclosure

A method for removing an oxide layer such as a natural oxide layer and a semiconductor manufacturing apparatus which uses the method to remove the oxide layer. A vertically movable susceptor is installed at the lower portion in a processing chamber and a silicon wafer is loaded onto the susceptor when it is at the lower portion of the processing chamber. The air is exhausted from the processing chamber to form a vacuum condition therein. A hydrogen gas in a plasma state and a fluorine-containing gas are supplied into the processing chamber to induce a chemical reaction with the oxide layer on the silicon wafer, resulting in a reaction layer. Then, the susceptor is moved up to the upper portion of the processing chamber, to anneal the silicon wafer on the susceptor with a heater installed at the upper portion of the processing chamber, thus vaporizing the reaction layer. The vaporized reaction layer is exhausted out of the chamber. The oxide layer can be removed with a high selectivity while avoiding damage or contamination of the underlying layer.

09/289,814